

WHAT IS CLAIMED IS:

1. An exposure apparatus which transfers a pattern onto a substrate by using pulse beams periodically, successively emitted by a light source for generating a pulse beam, comprising:

a photoelectric array having a plurality of photoelectric converters which detect pulse beams as electrical signals; and

a read circuit which reads the electrical signals from the plurality of photoelectric converters of said photoelectric array,

wherein said read circuit stores, in the plurality of photoelectric converters of said photoelectric array, charges corresponding to light quantities of pulse beams periodically, successively emitted by the light source to said photoelectric array, and reads electrical signals from all the plurality of photoelectric converters by using a plurality of time intervals between the pulse beams while reading electrical signals from some of the plurality of photoelectric converters by using each time interval between the pulse beams.

2. The apparatus according to claim 1, wherein said read circuit includes a reset circuit which resets a photoelectric converter from which an electrical signal has been read every time an electrical signal is read from said photoelectric array.

3. The apparatus according to claim 1, further comprising an adder which adds electrical signals read from the same photoelectric converter at different times.

5 4. The apparatus according to claim 1, wherein the number of photoelectric converters from which electrical signals are read by said read circuit at one time interval between pulses is determined in accordance with an emission frequency of the light
10 source.

5. The apparatus according to claim 4, wherein the number of photoelectric converters is determined to a relatively small number for a high emission frequency of the light source, and a relatively large number for
15 a low emission frequency of the light source.

6. The apparatus according to claim 1, wherein a count at which charges corresponding to pulse beams periodically, successively emitted by the light source to said photoelectric array are integrated and stored
20 in the plurality of photoelectric converters is determined in accordance with an intensity of the pulse beam emitted by the light source.

7. The apparatus according to claim 1, wherein said photoelectric array is arranged on a stage which holds
25 the substrate.

8. The apparatus according to claim 1, wherein said photoelectric array is so arranged as to detect a

integrated light quantity of a pulse beam split from an optical path extending from the light source to the substrate.

9. An exposure apparatus which transfers a pattern
5 onto a substrate by using pulse beams periodically,
successively emitted by a light source for generating a
pulse beam, comprising:

a photoelectric sensor which detects a pulse beam
as an electrical signal; and

10 a read circuit which reads the electrical signal
from said photoelectric sensor,

wherein the number of pulses corresponding to
charges to be stored in said photoelectric sensor
between one read operation and next read operation by
15 said read circuit is determined in accordance with an
intensity of the pulse beam emitted by the light
source.

10. The apparatus according to claim 9, wherein said
photoelectric sensor is arranged on a stage which holds
20 the substrate.

11. The apparatus according to claim 9, wherein said
photoelectric sensor is so arranged as to detect a
integrated light quantity of a pulse beam split from an
optical path extending from the light source to the
25 substrate.

12. A device manufacturing apparatus comprising:
a transfer step of transferring a pattern onto a

photosensitive agent applied to a substrate by using an exposure apparatus defined in claim 1; and

a developing step of developing the photosensitive agent.

5 13. A device manufacturing apparatus comprising:

a transfer step of transferring a pattern onto a photosensitive agent applied to a substrate by using an exposure apparatus defined in claim 9; and

a developing step of developing the
10 photosensitive agent.